

Appendix B: Mitigation Measures and Design Features

Mitigation measures and project design features considered in this analysis.

Mitigation Measure or Project Design Feature	Objective	Effectiveness and Basis	Forest Plan Standard & Guideline	Enforcement
Soil, Water & Fisheries				
Reduce erosion and sediment transport using: straw bales, silt fencing, filter fabric, temporary sediment ponds, check dams of pea gravel-filled burlap bags or other material, and/or immediate mulching of exposed areas	Prevent silt-laden water from entering streams	Moderate (Brown 2002)	BMPs: R-9 (USDA Forest Service 1988)	Project Administrator or their representative
When decommissioning or storing roads, apply treatments including: water-barring, pulling culverts, scarifying to depth of 12 inches, mulch with weed-free mulch, and/or seeding with approved seed mix. Erosion control measures must be in place prior to normal heavy rainfall period.	Increase roads' water energy dissipation prior to closure; reduce or eliminate erosion; improve water filtration	Moderate (Luce 1997) Burroughs (1989) (Erosion and Sediment Delivery Following Removal of Forest Roads. Earth Surface Processes and Landforms, Brown 2001)	ROD S&G RF-2, RF-3, RF-5; BMPs R-3, R-12, R-23, T-13; and Forest Plan S&Gs Water Resources and Riparian Reserves #3	Project Administrator or their representative
Pull back approach fill to an angle of natural repose when removing culverts.	Protect stream bank integrity and aquatic resources	Moderate (MBS Forest roads experience)	N/A	Project Administrator or their representative
Place large woody material removed from an existing culvert inlet into the stream channel downstream of the culvert unless doing so would cause habitat degradation	Maintain routing of large wood in channel network	Low (Experience shows wood is often broken during removal and placement is often difficult)	ACS Obj. 6	Project Administrator or their representative
Conduct ground-disturbing activities in or adjacent to perennial streams as permitted by instream work-windows established by MOU with Washington Department of Fish and Wildlife	Limit sediment delivery to streams from the road surface during time periods safer for fish	High (Avoidance of timing that would adversely affect fish, MOU between FS and WDFW for hydraulic projects (2010))	BMPs R-12; Forest Plan S&Gs Water Resources and Riparian Reserves #2	Project Administrator or their representative

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When treating roads: 1. Outslope the roadway surface unless outslowing would increase sediment delivery to streams or where outslowing is infeasible 2. Route road drainage away from channels and potentially unstable hill slopes. 3. Crown landings and staging areas to prevent concentrated runoff. 4. Where necessary, install water bars to route water away from streams to allow removal of fine sediment and other contaminants before discharge to the stream	Limit water accumulation and/or concentration, erosion, sediment delivery to streams' protect water quality	Moderate (Years of use by agency)	ROD S&G RF-5; BMPs R-1, R-3, R-4, R-5, R-7, R-8, R-9, R-11, R-12, R-14; BA	Project Administrator or their representative
When heavy equipment is present: 1. Make a hazardous spill plan and clean-up materials available on-site 2. Conduct any machinery maintenance involving potential contaminants (fuel, oil, hydraulic fluid, etc.) at an approved site or outside the Riparian Reserve 3. Prior to starting work each day, check all machinery for leaks and make all necessary repairs	Prevent and minimize effects to water quality	Moderate (Implementation of spill plans are an industry standard)	BMPs T-21, W-4; BA	Contractor, Forest Service Project Administrator or their representative
Wildlife				
Noise generating activities occurring between April 1 and September 15 would occur between two hours after sunrise to two hours before sunset.	Minimize sources of disturbance during the critical marbled murrelet breeding period	High (MBS Forest experience, references in BO (USDI USFWS 2002))	BA (USDA USFS 2002) BO (USDI USFWS 2002)	Project Administrator or their representative
Road repair, closure, or decommissioning work along the Suiattle River would not be scheduled during the bald eagle winter foraging season from December 1 through February 28	Minimize potential impacts to wintering eagles along the Suiattle River	High (MBS Forest experience, references in BO (USDI USFWS 2002))	BA (USDA USFS 2002) BO (USDI USFWS 2002)	Project Administrator or their representative
Specified down logs and especially concentrations of larger rotten logs would be left on-site, and left undisturbed if possible, to retain their habitat values in riparian areas.	Minimize potential impacts to large woody debris in riparian areas.	High (MBS Forest experience)	1990 Forest Plan S&G p 4-124	Project Administrator or their representative
Install a seasonal operated gate at the Tenas Creek Bridge on Road 2680 during the mountain goat winter season	Minimize potential impacts to goat winter range in upper Tenas Creek drainage	High (MBS Forest experience)	1990 Forest Plan S&G p 4-124	Forest Service Wildlife Staff and Project Administrator or their representative.

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Botany				
Actions conducted or authorized by the Forest Service that will operate outside the limits of the road prism require the cleaning of all heavy equipment prior to entering National Forest system lands.	Prevent introduction and spread of weeds into the Project area	Moderate (Logic)	USDA FS 2005a, 2005b	Project Administrator or their representative
Use weed-free straw and mulch for all projects on National Forest System lands.	Prevent introduction and spread of weeds into the Project area	High (Logic)	USDA FS 2005a, 2005b	Contractor, Forest Service Project Administrator or their representative
Inspect active gravel, fill, and stockpiles, quarry sites, and borrow materials for invasive plants before use and transport. Treat or require treatment of infested source before any use of pit material. Use only gravel, fill, sand, and rock this is judged to be weed free by District or Forest weed specialists.	Eradicate known infestations and prevent further infestation	High (Experience)	USDA FS 2005a, 2005b	Forest Service Botany Staff
Native plant materials are the first choice in revegetation for restoration and rehabilitation where timely natural regeneration of the native plant community is not likely to occur.	Prevent introduction and spread of weeds within the Project area	Moderate (Experience)	USDA FS 2005a, 2005b	Project Administrator or their representative
In decommissioning projects, existing infestations should be treated before the road is made undrivable.	Eradicate known infestations and prevent further infestation	High (Experience)	USDA FS 2005a, 2005b	Forest Service Botany Staff
If weeds are present in the project area, all equipment and gear should be cleaned before leaving the area to avoid spreading the infestation further.	Prevent spread of weeds within and outside of the Project area	Moderate (Logic)	USDA FS 2005a, 2005b	Project Administrator or their representative
When feasible, work from relatively weed-free areas into the infested area rather than vice-versa.	Prevent introduction and spread of weeds within the Project area	Moderate (Experience)	USDA FS 2005a, 2005b	Project Administrator or their representative

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Heritage and Cultural Resources				
H1 - If a previously unidentified resource is discovered during implementation, the project shall be stopped in the area of the find, and a reasonable effort made to secure it. The Forest Heritage Specialist shall be notified, and the agency official shall fulfill the responsibilities of the Forest Service pursuant to the Programmatic Agreement.	Protect cultural and historic resources	Moderate - Low	PA 1997; 36 CFR 800	Project Administrator or their representative
H2 - If any person knows or has reason to know that he or she has discovered Indian human remains, or specified cultural items identified in the Native American Graves Protection and Repatriation Act, he or she shall make a reasonable effort to secure the find, and notify the agency official, followed by written notification. The agency official shall ensure that the agency's processes and procedures under NAGPRA are followed.	Protect cultural resources	Moderate - High	43 CFR 10	Project Administrator or their representative
H3 - Protect historic features identified by surveys through avoidance by placing no-disturbance buffers around them.	Protect historic resources	High	PA 1997; 36 CFR 800	Project Administrator or their representative
Recreation				
Roads 26, 2680, 2660, 25, and 27 should be kept open for public use from May 1 to October 1. If delays are needed they should be 30 minutes or less and only allowed during week days. If longer delays are necessary, at least a 2 week advance public notice is required.	Minimize effects on recreationist and other forest users	High (experience)	1990 Forest Plan p. 4-84, 4-140	Project Administrator or their representative
When decommissioning or treating closed roads keep up to 150 feet at beginning of road open for dispersed camping opportunities, if conditions allow.	Minimize effects on dispersed recreationists	High (experience)	1990 Forest Plan p. 4-84	Project Administrator or their representative

Supplement

Several new programmatic permits have been developed in the past year with the State of Washington and the US Army Corps of Engineers to ensure compliance with Washington Administrative Codes and the Clean Water Act. This project will be covered by and conducted in compliance with Regional General Permit #8 (RGP-8), as established on July 19, 2011 by the Seattle District US Corps of Engineers. Additionally, the Forest Service will comply with State water laws by adhering to a revised MOU between the Washington Department of Fish and Wildlife and the US Forest Service within the State of Washington, which is currently in draft form and should be signed imminently. As a result of these new documents, management requirements on the following page have been included and are now applicable to this project.

Supplemental mitigation measures and project design features considered in this analysis

Mitigation Measure or Project Design Feature	Objective	Effectiveness and Basis	Forest Plan Standard & Guideline	Enforcement
<p>Comply with all requirements of the most recent MOU between the Washington Department of Fish and Wildlife and US Forest Service for Hydraulic Permit Approval (In draft, 2012), including the "General Provisions Applicable to all Appendix A Projects," and specific provisions applicable to this project, which include:</p> <p>For roads receiving upgrade and repair treatments: bank protection (p. 8), permanent culvert installation and replacement (pp. 9-10), and permanent bridge installation (p. 11).</p> <p>For roads receiving obliteration treatments, i.e. storage or decommission: permanent culvert, bridge, and ford removal (p. 12), temporary culvert and bridge installation (p. 13), culvert and bridge debris removal (pp. 18-19), Instream Habitat Improvements (p. 20), and streambank restoration (p. 21).</p>	<p>Ensuring compliance with State regulations that protect aquatic and related resources</p>	<p>Moderate</p>	<p>WDFW MOU (In draft, 2012)</p>	<p>Project Administrator or their representative</p>

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Comply with and adhere to all requirements of RGP-8 authorized by the Seattle District of the US Army Corps of Engineers, including all special conditions, general conditions, and design	Compliance with Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act of	Moderate	RGP-8 (2011)	Project Administrator or their representative
criteria of the authorized activities. The primary authorized activities to be used in this project are 10. Road Treatments and 7. Fish Passage Culvert and Bridge Projects, but this project may also employ: 3. Bank Restoration, 4. Head-cut stabilization and Associated Fish Passage, and 8. Floodplain Overburden Removal.	1899.			

